BEFORE THE
PUBLIC SERVICE COMMISSION OF
SOUTH CAROLINA
DOCKET NO. 2018-3-E

In the Matter of	)	
Annual Review of Base Rates	)	**DIRECT TESTIMONY OF**
for Fuel Costs for	)	**ERIC GRANT FOR**
Duke Energy Carolinas, LLC	)	**DUKE ENERGY CAROLINAS, LLC**

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Eric Grant. My business address is 526 South Church Street, Charlotte, North Carolina 28202.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am Vice President, Fuels & Systems Optimization for Duke Energy Corporation ("Duke Energy"). In that capacity, I lead the organization responsible for the purchase and delivery of coal, natural gas, fuel oil, reagents, and emissions to Duke Energy's regulated generation fleet, including Duke Energy Carolinas, LLC ("Duke Energy Carolinas," "DEC," or the "Company") and Duke Energy Progress, LLC ("DEP") (collectively, the "Companies"). In addition, I manage the fleet's power trading, system optimization, energy supply analytics, and contract admission functions.

Q. PLEASE BRIEFLY SUMMARIZE YOUR EDUCATIONAL AND PROFESSIONAL EXPERIENCE.

A. I have a Bachelor of Science degree in Electrical Engineering from North Carolina State University. I joined Progress Energy in 1990, as an engineer in the Nuclear Engineering Department. From 2000-2006, I held a variety of management positions within Progress Energy's System Planning and Operations Department, including managing system operations for what is now DEP and Duke Energy Florida, LLC ("DEF"). In 2007, I became General Manager for the DEF Combined Cycle and Combustion Turbine Generation Fleet. I joined Duke Energy in July 2012 as the Managing Director of System Optimization, the position which I held until April 2017. I assumed my current position in April 2017. I am also a licensed professional engineer in the state of North Carolina.

Q. HAVE YOU TESTIFIED OR SUBMITTED TESTIMONY BEFORE THIS COMMISSION IN ANY PRIOR PROCEEDINGS?

A. Yes. I testified before the Public Service Commission of South Carolina ("PSCSC" or "Commission") in DEP's 2018 fuel and environmental cost recovery proceeding in Docket No. 2018-1-E.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to describe DEC's fossil fuel purchasing practices, provide fossil fuel costs for the period June 1, 2017 through May 31, 2018 ("review period") versus June 1, 2016 through May 31, 2017 ("prior review period"), and describe changes forthcoming in the period of October 1, 2018 through September 30, 2019 ("billing period").

Q. YOUR TESTIMONY INCLUDES TWO EXHIBITS. WERE THESE EXHIBITS PREPARED BY YOU OR AT YOUR DIRECTION AND UNDER YOUR SUPERVISION?

A. Yes. These exhibits were prepared at my direction and under my supervision, and consist of Grant Exhibit 1, which summarizes the Company's Fossil Fuel Procurement Practices, and Grant Exhibit 2, which summarizes total monthly natural gas purchases and monthly contract and spot coal purchases during the review period and the prior review period.

Q. HOW DOES THE COMPANY OPERATE ITS PORTFOLIO OF GENERATION ASSETS TO RELIABLY AND ECONOMICALLY SERVE ITS CUSTOMERS?

A. Both DEC and DEP utilize the same process to ensure that the assets of the Companies are reliably and economically committed and dispatched to serve their respective customers. To that end, both companies consider factors that include, but are not limited to, the latest forecasted fuel prices, transportation rates, planned maintenance and refueling outages at the generating units, generating unit performance parameters, and expected market conditions associated with power purchases and off-system sales opportunities in order to determine the most economic and reliable means of serving their customers.

Q. PLEASE DESCRIBE DEC'S DELIVERED COST OF COAL AND NATURAL GAS DURING THE REVIEW PERIOD.

A. The Company's average delivered cost of coal per ton for the review period was $75.45 per ton, compared to $78.29 per ton in the prior review period, representing a decrease of approximately 4 percent. This includes an average transportation cost of $26.80 per ton in the review period, compared to $26.42 per ton in the prior review period, representing an increase of approximately 1 percent. The Company's average price of gas purchased for the review period was $4.00 per Million British Thermal Units ("MMBtu"), compared to $3.54 per MMBtu in the prior review period, representing an increase of approximately 13 percent. The cost of gas is inclusive of gas supply, including biogas (beginning this review period), transportation, storage and financial hedging.

DEC's coal burn for the review period was 9.5 million tons, compared to a coal burn of 10.6 million tons in the prior review period, representing a decrease of 10 percent. The Company's natural gas burn for the review period was 94.7 million MMBtu compared to a gas burn of 84.0 million MMBtu in the prior review period, representing an increase of approximately 13 percent. The primary contributing factors were the new Lee combined cycle facility becoming commercially available April 5, 2018 for the final two months of the review period coupled with changes in commodity prices and weather-driven demand.

Q. PLEASE DESCRIBE THE LATEST TRENDS IN COAL AND NATURAL GAS MARKET CONDITIONS.

A. Coal markets continue to be impacted by a number of factors, including: (1) uncertainty around proposed, imposed, and stayed U.S. Environmental Protection Agency ("EPA") regulations for power plants; (2) continued abundant natural gas supply and storage resulting in lower natural gas prices, which has lowered overall coal demand; (3) continued changes in global market demand for both steam and metallurgical coal; (4) uncertainty surrounding regulations for mining operations; and (5) tightening supply as bankruptcies, consolidations and company reorganizations have allowed coal suppliers to restructure and settle into new, lower on-going production levels.

With respect to natural gas, the nation's natural gas supply has grown significantly over the last several years and producers continue to enhance production techniques, increase efficiencies, and lower production costs. Natural gas prices are reflective of the dynamics between supply and demand factors, and in the short term, such dynamics are influenced primarily by seasonal weather demand and overall storage inventory balances. In addition, there continues to be growth in the natural gas pipeline infrastructure needed to serve increased market demand. However, pipeline infrastructure permitting and regulatory process approval efforts are taking longer due to increased reviews and interventions, which can delay and change planned pipeline construction and commissioning timing.

Over the longer term planning horizon, natural gas supply is projected to continue to increase along with the needed pipeline infrastructure to move the growing supply to meet demand related to power generation, liquefied natural gas exports and pipeline exports to Mexico.

Q. WHAT ARE THE PROJECTED COAL AND NATURAL GAS CONSUMPTIONS AND COSTS FOR THE BILLING PERIOD?

A. DEC's current coal burn projection for the billing period is 6.8 million tons compared to 9.5 million tons consumed during the review period. DEC's billing period projections for coal generation may be impacted due to changes from, but not limited to, the following factors: delivered natural gas prices versus the average delivered cost of coal, volatile power prices, and electric demand. Combining coal and transportation costs, DEC projects average delivered coal costs of approximately $79.77 per ton for the billing period compared to $75.45 per ton in the review period. This cost, however, is subject to change based on, but not limited to, the following factors: (1) exposure to market prices and their impact on open coal positions; (2) the amount of non-Central Appalachian coal DEC is able to consume; (3) performance of contract deliveries by suppliers and railroads, which may not occur despite DEC's strong contract compliance monitoring process; (4) changes in transportation rates; and (5) potential additional costs associated with suppliers' compliance with legal and statutory changes, the efforts of which can be passed on through coal contracts.

DEC's current natural gas burn projection for the billing period is approximately 166.5 million MMBtu, which is an increase from the 94.7 MMBtu consumed during the review period. The net increase in DEC's overall natural gas burn projections for the billing period versus the test period is driven by (1) the new Lee combined cycle facility, which became commercially available in the last two months of the review period, and (2) the inclusion of natural gas generation at Cliffside as a result of the dual fuel conversion becoming commercial available in late 2018. The current average forward Henry Hub price for the billing period is $2.83 per MMBtu, compared to $2.96 per MMBtu in the review period. Projected burn volumes will vary based on factors such as, but not limited to, changes in commodity prices and weather driven demand.

Q. WHAT STEPS IS DEC TAKING TO MANAGE PORTFOLIO FUEL COSTS?

A. The Company continues to maintain a comprehensive coal and natural gas procurement strategy that has proven successful over the years in limiting average annual fuel price changes while actively managing the dynamic demands of its fossil fuel generation fleet in a reliable and cost effective manner. Aspects of this procurement strategy include having an appropriate mix of contract and spot purchases for coal, staggering coal contract expirations which thereby limit exposure to market price changes, diversifying coal sourcing as economics warrant, as well as working with coal suppliers to incorporate additional flexibility into their supply contracts. The Company expects to address any spot and long-term coal requirements throughout this year with any potential competitively bid purchases, if made, taking into account projected coal burns, as well as coal inventory levels.

The Company has implemented natural gas procurement practices that include periodic Request for Proposals and short-term market engagement activities to procure and actively manage a reliable, flexible, diverse, and competitively priced natural gas supply that includes contracting for volumetric optionality in order to provide flexibility in responding to changes in forecasted fuel consumption. Lastly, DEC continues to maintain a short-term natural gas hedging plan to manage fuel cost risk for customers via a disciplined, structured execution approach. DEC continues to monitor and make adjustments as necessary to its natural gas hedging program.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes, it does.

Duke Energy Carolinas, LLC Fossil Fuel Procurement Practices

Coal

- Near and long-term coal consumption is forecasted based on inputs such as load projections, fleet maintenance and availability schedules, coal quality and cost, environmental permit and emissions considerations, projected renewable capacity, and wholesale energy imports and exports.
- Station and system inventory targets are developed to provide reliability, insulation from short-term market volatility, and sensitivity to evolving coal production and transportation conditions. Inventories are monitored continuously.
- On a continuous basis, existing purchase commitments are compared with consumption and inventory requirements to determine additional needs.
- All qualified suppliers are invited to participate in proposals to satisfy additional or contract needs.
- Spot market solicitations are conducted on an on-going basis to supplement contract purchases.
- Contracts are awarded based on the lowest evaluated offer, considering factors such as price, quality, transportation, reliability and flexibility.
- Delivered coal volume and quality are monitored against contract commitments. Coal and freight payments are calculated based on certified scale weights and coal quality analysis meeting ASTM standards as established by ASTM International.

Gas

- Near and long-term natural gas consumption is forecasted based on inputs such as load projections, commodity and emission prices, projected renewable capacity, and fleet maintenance and availability schedules.
- Physical procurement targets are developed to procure a cost effective and reliable natural gas supply.
- Over time, short-term and long-term Requests for Proposals and market solicitations are conducted with potential suppliers to procure the cost competitive, secure, and reliable natural gas supply, firm transportation, and storage capacity needed to meet forecasted gas usage.
- Short-term and spot purchases are conducted on an on-going basis to supplement term natural gas supply.
- On a continuous basis, existing purchases are compared against forecasted gas usage to ascertain additional needs.
- Natural gas transportation for the generation fleet is obtained through a mix of long-term firm transportation agreements, and shorter term pipeline capacity purchases.
- A targeted percentage of the natural gas fuel price exposure is managed via a rolling 36-month structured financial natural gas hedging program.
- Through the Asset Management and Delivered Supply Agreement between Duke Energy Carolinas, LLC (“DEC”) and Duke Energy Progress, LLC implemented on January 1, 2013, DEC serves as the designated Asset Manager that procures and manages the combined gas supply needs for the combined Carolinas gas fleet.

Fuel Oil

- No. 2 fuel oil is burned primarily for initiation of coal combustion (light-off at steam plants) and in combustion turbines (peaking assets).
- All No. 2 fuel oil is moved via pipeline to applicable terminals where it is then loaded on trucks for delivery into the Company's storage tanks. Because oil usage is highly variable, the Company relies on a combination of inventory, responsive suppliers with access to multiple terminals, and trucking agreements to manage its needs. Replenishment of No. 2 fuel oil inventories at the applicable plant facilities is done on an "as needed basis" and coordinated between fuel procurement and station personnel.
- Formal solicitations for supply may be conducted as needed with an emphasis on maintaining a network of reliable suppliers at a competitive market price in the region of our generating assets.

DUKE ENERGY CAROLINAS
Summary of Coal Purchases
Twelve Months Ended May 2018 & 2017
Tons

Line No.	Month	Contract (Tons)	Net Spot Purchase and Sales (Tons)	Total (Tons)
1	June 2017	587,819	212,159	799,978
2	July	824,226	96,829	921,055
3	August	807,076	179,219	986,295
4	September	678,951	105,441	784,392
5	October	505,295	95,857	601,152
6	November	415,136	58,616	473,752
7	December	593,868	47,388	641,256
8	January 2018	453,755	60,390	514,145
9	February	770,299	0	770,299
10	March	818,185	48,963	867,148
11	April	728,025	13,269	741,294
12	May	712,467	11,115	723,582
13	**Total** (Sum L1:L12)	**7,895,102**	**929,246**	**8,824,348**

Line No.	Month	Contract (Tons)	Net Spot Purchase and Sales (Tons)	Total (Tons)
14	June 2016	589,911	0	589,911
15	July	632,526	32,792	665,318
16	August	776,090	102,042	878,132
17	September	706,719	124,390	831,109
18	October	670,555	111,340	781,895
19	November	618,162	86,162	704,324
20	December	418,820	169,306	588,126
21	January 2017	492,404	285,634	778,038
22	February	769,679	34,968	804,647
23	March	797,907	47,438	845,345
24	April	762,700	122,152	884,852
25	May	616,088	196,451	812,539
26	**Total** (Sum L14:L25)	**7,851,561**	**1,312,675**	**9,164,236**

DUKE ENERGY CAROLINAS
Summary of Gas Purchases
Twelve Months Ended May 2018 & 2017
MBTUs

Line No.	Month	MBTUs
1	June 2017	6,420,642
2	July	7,915,859
3	August	7,234,856
4	September	6,922,715
5	October	7,413,255
6	November	8,239,078
7	December	6,725,316
8	January 2018	6,638,156
9	February	6,512,143
10	March	10,050,310
11	April	10,537,626
12	May	10,067,211
13	**Total** (Sum L1:L12)	**94,677,167**

Line No.	Month	MBTUs
14	June 2016	6,762,343
15	July	8,910,962
16	August	9,041,077
17	September	8,688,003
18	October	5,484,777
19	November	8,788,064
20	December	6,064,292
21	January 2017	6,197,082
22	February	6,087,279
23	March	6,952,395
24	April	4,229,605
25	May	6,556,798
26	**Total** (Sum L14:L25)	**83,762,677**